AMENDMENT TO THE CLAIMS

1. (original): A geospatial database management system (GDMS), mounted on a host vehicle, managing geospatial data relating to travel paths having one or more lanes, comprising:

a geospatial database storing data elements indicative of objects and a location of the objects in three dimensional space, the objects having a lane-level resolution and the location having an accuracy of approximately one decimeter or less;

a database manager component configured to maintain the data elements in the geospatial database and receive database queries from a driver assist subsystem configured to assist a driver of the host vehicle based on the data elements stored in the geospatial database; and

a query processor coupled to the database manager component and the geospatial database and configured to receive the database queries from the database manager component, query the geospatial database based on the database queries and return query results to the database manager component.

2. (original): The GDMS of claim 1 wherein the database manager component and the query processor are configured to return the query results in substantially real time.

3. (original): The GDMS of claim 2 wherein the database manager component and the query processor are configured to return the query results within approximately 100 milliseconds (ms) of receiving the database query from the driver assist subsystem.

4. (original): The GDMS of claim 3 wherein the database manager component and the query processor are configured to return the

query results within approximately 50ms of receiving the database query from the driver assist subsystem.

5. (original): The GDMS of claim 3 wherein the database manager component and the query processor are configured to return the query results within approximately 12ms of receiving the database query from the driver assist subsystem.

6. (currently amended): The GDMS of claim 3 wherein the location of the objects in the geospatial database is accurate to within less than one decimeter.

7. (original): The GDMS of claim 6 wherein the location of the objects in the geospatial database is accurate to within less than approximately +/- 0.1 meters.

8. (original): The GDMS of claim 7 wherein the location of the objects in the geospatial database is accurate to within a range of approximately +/- 2-10 centimeters.

9. (original): The GDMS of claim 1 wherein the database query from the driver assist subsystem includes a query polygon indicative of a geospatial region of interest and wherein the query processor is configured to identify data elements in the geospatial database that have a location that intersects with the query polygon.

10. (original): The GDMS of claim 9 wherein the database manager component maintains the geospatial database according to tiles, each tile corresponding to a predetermined geospatial region, each tile including one or more corresponding data element lists, each data element list listing data elements of a specified element type that intersect with the corresponding tile.

11. (original): The GDMS of claim 10 wherein the query processor is configured to identify data elements in the geospatial database that have a location that intersects with the query polygon by identifying tiles as intersecting tiles if they intersect with the query polygon.

12. (currently amended): The GDMS of claim 11 wherein the database query includes a data element indicator indicating relevant data element types that are relevant to the database query, and wherein the query processor is configured to search the data element lists in the intersecting tiles to identify relevant data element lists that contain ~~date~~ data elements having the relevant data element types.

13. (original): The GDMS of claim 12 wherein the query processor is configured to identify data elements in the geospatial database that have a location that intersects with the query polygon by identifying data elements in the relevant data element lists that intersect with the query polygon.

14. (original): The GDMS of claim 1 wherein the database manager component is configured to maintain the data elements in the geospatial database as data objects having an attribute portion and a spatial data portion, the attribute portion including attributes indicative of the data object and the spatial data portion including data indicative of the location of the object in three dimensional space.

15. (original): The GDMS of claim 14 wherein the data objects include a LaneBoundary object representative of a roadway lane boundary.

16. (original): The GDMS of claim 14 wherein the data objects include a RoadShoulder object representative of a roadway shoulder.

17. (original): The GDMS of claim 14 wherein the data objects include a RoadIsland object representative of a roadway island.

18. (original): The GDMS of claim 14 wherein the data objects include a LaneCenter object representative of a roadway lane center.

19. (original): The GDMS of claim 14 wherein the data objects are configured based on requirements of the driver assist subsystem.

20. (original): The GDMS of claim 14 wherein the attributes are indicative of how to draw the data object on a display.

21. (original): The GDMS of claim 14 wherein the data objects include objects representative of structures adjacent to the travel paths.

22. (original): The GDMS of claim 21 wherein the data objects are representative of one or more of mailboxes, jersey barriers, guard rails, bridge abutments, tunnel walls, ground plane and ceiling, curbs, curb cutouts, fire hydrants, light posts, traffic signal posts, sign and sign posts.

23. (original): A geospatial database management system (GDMS) for use on a host vehicle with a driver assist subsystem, comprising:

a geospatial database storing objects having attributes indicative of items relating to a travel path for the host vehicle and a location of the items in a coordinate system, the objects being stored with lane-

level resolution sufficient to distinguish among different lanes in the travel path; and

a database accessing system configured to access the objects in the geospatial database, in response to a query from the driver assist subsystem, in substantially real time.

24. (original): The GDMS of claim 23 wherein the database accessing system is configured to return query results within approximately 100 milliseconds (ms) of receiving the query from the driver assist subsystem.

25. (original): The GDMS of claim 24 wherein the database accessing system is configured to return the query results within approximately 50ms of receiving the query from the driver assist subsystem.

26. (original): The GDMS of claim 25 wherein the database accessing system is configured to return the query results within approximately 12ms of receiving the query from the driver assist subsystem.

27. (original): A geospatial database management system (GDMS) for use on a host vehicle with a driver assist subsystem, comprising:

a geospatial database storing objects having attributes indicative of items relating to a travel path for the host vehicle and a location of the items in a coordinate system, the location being accurate to within approximately 1 decimeter; and

a database accessing system configured to access the objects in the geospatial database, in response to a query from the driver assist subsystem, in substantially real time.

28. (original): The GDMS of claim 27 wherein the geospatial database stores the objects with lane-level resolution sufficient to distinguish among different lanes in the travel path.

29. (original): The GDMS of claim 27 wherein the location is accurate to within approximately +/- 0.1 meters.

30. (original): The GDMS of claim 29 wherein the location is accurate to within a range of approximately +/- 2-10 centimeters.

31. (previously presented): The system of claim 1, wherein the driver assist subsystem includes a head-up display that generates an image of boundaries of the lanes of the travel paths.

32. (previously presented): The system of claim 31, wherein the head-up display is positioned in the host vehicle such that the boundaries of the image substantially overlay actual lane boundaries of the travel paths when viewed by the driver of the host vehicle.

33. (previously presented): The system of claim 32, including a radar subsystem configured to detect objects in a vicinity of the host vehicle and pass a location of the detected objects to the head-up display which modifies the image to include a graphical representation of the detected objects that substantially overlay the detected objects when viewed by the driver of the host vehicle.

34. (previously presented): The system of claim 1, wherein the driver assist subsystem generates haptic feedback to the driver of the host vehicle.

35. (previously presented): The system of claim 34, wherein the haptic feedback is generated in response to a position of the host vehicle relative to the location of the objects corresponding to the data elements stored in the geospatial database.

36. (previously presented): The system of claim 34, wherein the haptic feedback is generated through a steering wheel, a brake pedal, or a seat.

37. (previously presented): The system of claim 34, wherein the driver assist subsystem is a virtual rumble strip.

38. (previously presented): The system of claim 1, wherein the driver assist subsystem generates a warning based on a position of the host vehicle relative to the location of the objects corresponding to the data elements stored in the geospatial database.

39. (currently amended): The system of claim 38, wherein the warning is at least one of a visual warning, an audio warning, a tactile warning, and~~/or~~ a haptic warning.

40. (previously presented): The system of claim 33, including a radar filtering subsystem that blocks the passage of the location of selected objects, detected by the radar subsystem, to the head-up display.

41. (previously presented): The system of claim 34, wherein the haptic feedback includes at least one stimulus applied to the driver of the host vehicle.

42. (currently amended): The system of claim 41, wherein the stimulus includes at least one of a vibration, a force, a torque, and~~/or~~ a motion.

43. (previously presented): The system of claim 1, including a radar subsystem configured to detect objects in a vicinity of the host vehicle and pass a location of the detected objects to the driver assist subsystem.

44. (previously presented): The system of claim 43, including a radar filtering subsystem that blocks the passage of the location of selected objects, detected by the radar subsystem, to the driver assist subsystem.